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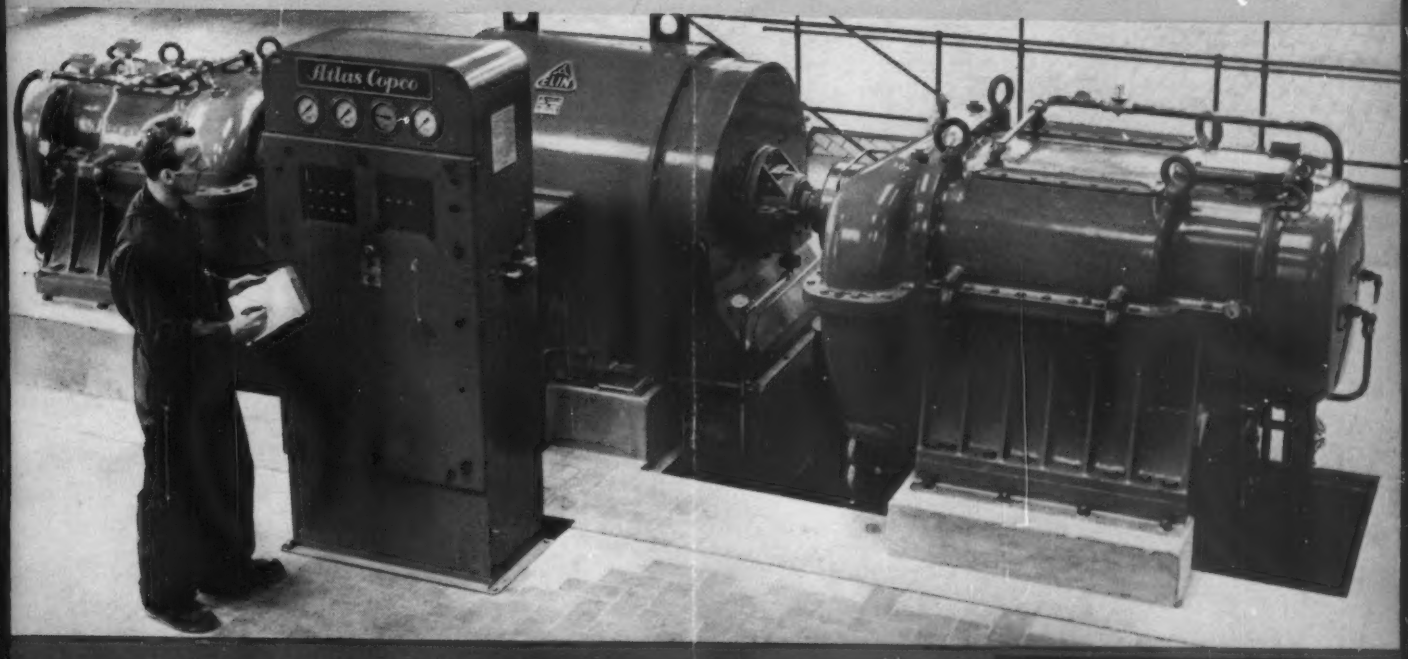

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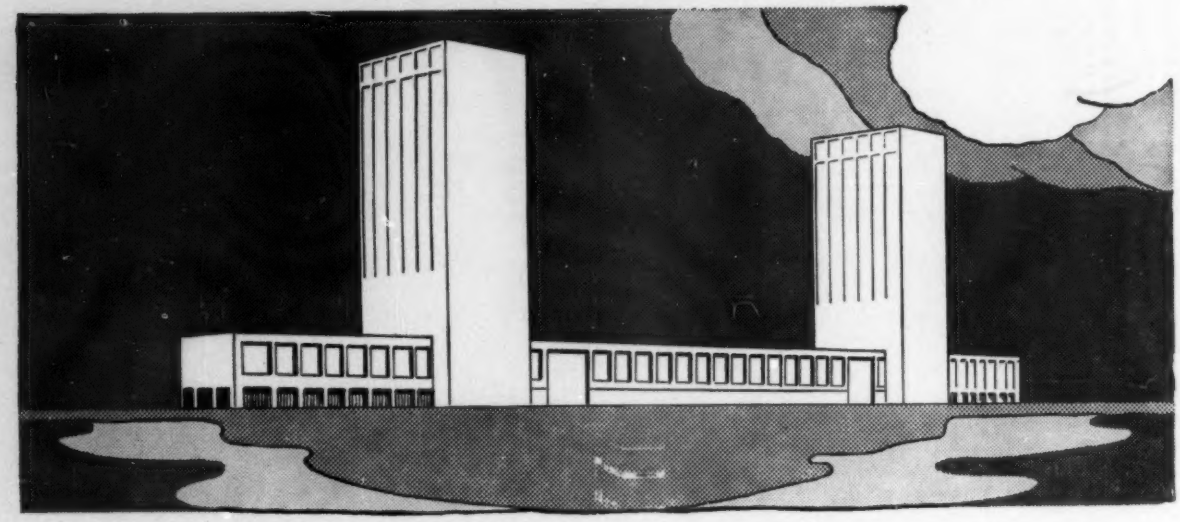

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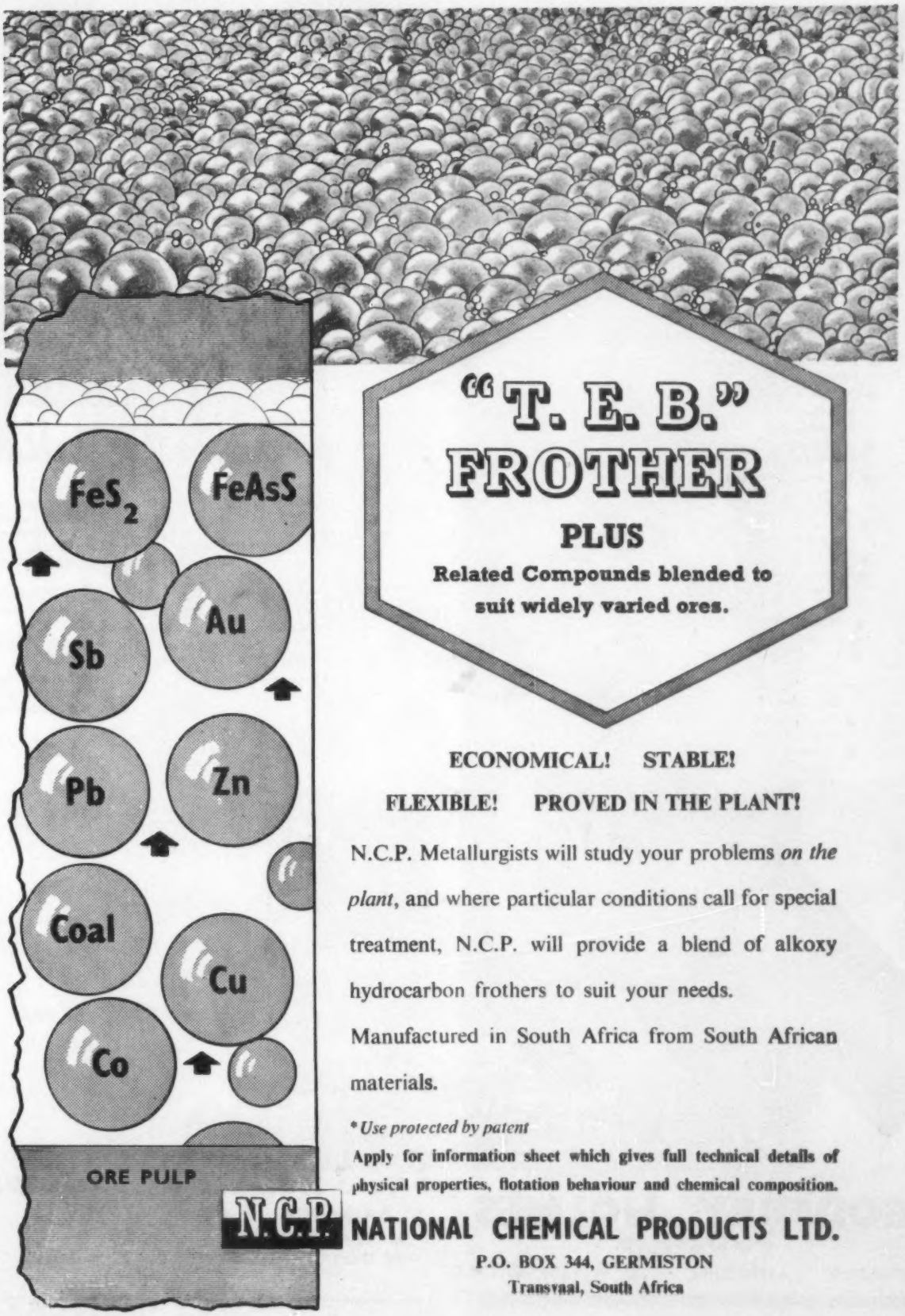

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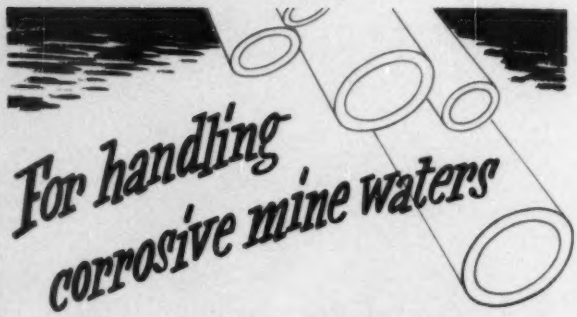

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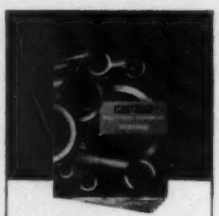

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The Mining Journal

London, December 26, 1958

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Better Times in Sight?

THE year now ending opened in depressing fashion for most sections of the mining industry. Producers' stocks were still accumulating as users' inventories declined, markets remained sluggish, and prices were continuing their downward trend. Overhanging lead and zinc producers was anxiety — which proved to be only too well founded — that the U.S. Government would be unable to withstand pressure from the domestic industry for protective measures in the form of import quotas or higher tariffs. Adding to the difficulties of aluminium, tin and platinum producers were the rising quantities of metal exported from Communist countries and offered at prices lower than those quoted by leading Free World suppliers, whether for motives that were purely commercial or as a form of economic war.

Gold producers, on the other hand, were beginning to feel the bracing effect, at any rate on the stockmarket, of the chill winds blowing through the London Stock Exchange, though the profits of marginal mines were still being flattened between the hammer of rising costs and the anvil of an unrealistic and immoveable gold price.

What will be the verdict of the mining industry on 1958? On the whole it will probably be favourable, though by no means unanimously so. For some sections it has brought substantial progress on the road to recovery, even if the gains have not in all cases been fully maintained. To others it has brought little cheer. Its passing will certainly not be regretted by the coalmining industries of Britain and the European Iron and Steel Community, which end the year with vast quantities of unsold stocks and little prospect of reducing them very appreciably in the coming year. The National Coal Board has been compelled to ask Parliament for increased borrowing powers. After struggling for years to keep pace with rising consumption, it is now engaged in the unenviable task of scaling production down to the level of demand anticipated during the coming year. For the coalmining industry times have indeed changed!

Throughout 1958 base metal producers in Free World countries were anxiously scanning the weekly steel output figures, which have come to be regarded as America's economic pulse. In the early months U.S. steel production declined to less than half-rated capacity; towards mid-year, however, the pendulum began to swing with increasing momentum in the reverse direction until about 75 per cent of capacity operation was attained. The process of inventory liquidation has seemingly ended as in some directions users' stocks seem dangerously low.

The effects of the American recovery on the metal markets, however, have been tempered latterly by the declining tempo of industrial activity in Britain and Western Europe, where the growth of unemployment has become a matter for serious concern. The British Government, having deflated the economy by a 7 per cent bank rate and credit squeeze, is now endeavouring to put industry back into forward gear by cheaper money and the easing of credit restrictions—a reversal of policy made possible by the strength of the pound and the spectacular improvement in the gold and foreign exchange reserves.

A particularly unsettling influence during the year was the uncertainty created by the Eisenhower Administration's protracted but unavailing attempts to find some means of assisting the domestic mining industry without adding to the difficulties of other countries, which derive substantial dollar revenues from sales of these metals to the United States. Unhappy about accepting the Tariff Commission's recommendations for increased duty on imports of foreign lead and zinc, the Administration submitted proposals to Congress for subsidies to U.S. producers of copper, lead, zinc, fluorspar and tungsten, the proposed stabilization prices to be paid on specified annual amounts of domestic production.

Rather surprisingly the Seaton Plan, as it came to be known, was extended to include the stockpiling of 150,000 tons of copper in order to relieve the market of surplus production, and it may well have been this provision which led to its rejection by Congress. At the very time when the Bill was before the House and when its prospects seemed rather more favourable, Kennecott increased production at its western properties from four to five days a week and announced a further scheduled increase to a six-day week, giving as a reason the improved demand.

How far this may have contributed to the defeat of the Bill is a matter for speculation, as are the reasons for Kennecott's action. It is at any rate noteworthy that the copper mining industry, as a result of output cuts by major producers, has succeeded in bringing supply into balance with demand without government intervention, aided by a strike on the Copperbelt which lasted for nearly two months and another at International Nickel's Sudbury works, which has only just ended. There has also been a significant increase in U.S. consumption of copper. Due to these various causes, world copper stocks are equivalent, at the time of writing, to little more than a month's supply. The price of copper, after falling to £160 and rising during the strike to £260, now stands at about £220.

For lead and zinc producers outside the United States the rejection of the Seaton Plan had more serious consequences, since it led to the imposition of import quotas based on average shipments during the past five years. With a timing remarkable for its maladroitness, this measure was announced while the Montreal Conference to promote the economic expansion of the Commonwealth was in session. It resulted in a storm of protests from Canada, Australia, Mexico and Peru against what was regarded as a departure from America's stated policy of trying to free world trade. No country was more severely hit than Australia, whose exports to the United States have been rising sharply over the past five years. The pill was scarcely sweetened by the reflection that the American Government was directly responsible for the present situation of over-supply, since its buying and stockpiling programme pushed prices up and encouraged the expansion of production both at home and abroad.

The feasibility of establishing some degree of international control over the lead/zinc industry, if only temporarily, was examined at two international conferences held respectively in London and Geneva. As was doubtless to be expected, however, the discussions resulted in nothing more positive than decisions to set up an international study group to consider ways and means of meeting present difficulties, and to examine the possibility of establishing some sort of short-term agreement.

For the International Tin Council the year 1958 resembled one of those nightmares in which you find yourself running faster and faster without gaining on your pursuer—in this case, obviously a bear. The year opened with a tin floor of £730, and the introduction of quotas equivalent to an overall reduction of about 40 per cent in exports from the six participating producing countries. Hopes that once the "pipeline" had been emptied the effects of these measures would soon make themselves felt, were dashed by the persistent absence of consumer buying and the rising flood of Russian tin. Despite a further reduction in the export rate, the tin price remained firmly anchored to the floor until the middle of September, when the buffer stock manager ran out of funds. Once the market had absorbed the initial shock, the effects of the restrictions at last began to be reflected in an upward movement in the price. In view of the strong statistical position, signs of a rising consumer demand, and promised co-operation from the U.S.S.R., tin producers can be confident that, while the existing restrictions are likely to remain in force for much of the coming year, the most critical period has been weathered, albeit at a heavy price.

Though production and shipments of primary and semi-fabricated metal declined for the second year running, 1958 has been by no means wholly unfavourable for the aluminium industry. Despite the highly competitive conditions prevailing in Free World markets and the undercutting of North American prices by Russian metal, aluminium ends the year in an encouraging position, due to the emphasis on sales promotion and the success achieved in the development of new outlets and the expansion of existing uses. Moreover, the industry has sufficient capacity available to meet the large upsurge in demand which is foreseen.

The past twelve months have witnessed further progress in some of the ambitious projects for the production of alumina and the establishment of aluminium plants in Africa based on indigenous bauxite resources and low-cost hydroelectric power. It has been stated that the alumina plant under construction at Fria will not be affected by French Guinea's vote for independence and the proposal for a union of Guinea and Ghana, but there appears to be some uncertainty as to the effects of these political developments on the £125,000,000 Konkoure project.

In this country, 1958 will also be remembered for the tussle between two of America's "Big Four" for control of a British firm which is an integrated producer and fabricator of aluminium with world-wide interests including extensive bauxite resources in Africa and Australia.

To no metal has 1958 brought a more dramatic reversal of fortune than to tungsten. At the beginning of the year wolfram and scheelite were quoted in London at 92s. 6d./100s. per l.ton unit c.i.f., compared with 220s./225s. in January, 1957, and 272s./276s. in January, 1956. Throughout the first half of 1958 prices continued their steady slide, the bottom being finally reached in July when quotations fell to 60s./63s. The long period of uneconomic prices led to the suspension of production by a large number of wolfram and scheelite producers throughout the world. In the fourth quarter the pendulum began at last to swing the other way and the year closes, as it started, with the London quotation touching 100s., which does at least suggest that the corner may have been turned.

Nickel, after years of scarcity, began 1958 with the supply of market and premium price metal in close balance with demand. Early this year it became apparent that the high rate of Free World production, in conjunction with sharply reduced defence demands and the efforts of the U.S. Government to divert to industry all nickel scheduled for stockpile intake, had led to over-supply. Despite cutbacks by International Nickel, stocks in the hands of the U.S. Government and of Inco itself have risen substantially,

By September, when the prolonged strike at the Sudbury works broke out, stocks of nickel outside the U.S. Government stockpile amounted to at least 150,000 and possibly 175,000 s.tons. Meanwhile, nickel producers have intensified their marketing activities, particular attention being devoted to the development of new stainless steel uses, and they are confident that an improved demand will not be long delayed. Inco itself has convincingly demonstrated its faith in nickel by pressing forward with its huge Manitoba project.

For platinum the break in the clouds is still only faintly discernible. Despite extensive cuts by South African and Canadian producers, the prices quoted by the two leading refiners have been chasing open market prices downwards by successive reductions without ever quite catching them, like a dog chasing its own tail. One of the two main causes is the reduced demand from the oil industry, which has fallen far below expectations, the other being heavy offerings of cheap Russian platinum which have undermined the market.

Though 1958 does not appear—on the surface, at any rate—to have brought a price rise for gold much nearer, the year has been by no means an unfavourable one for gold producers as a whole. The South African output has continued to advance and for the greater part of the year prices on the Kaffir market have been trending upwards. This tendency has been accentuated by the success of the American South African Investment Co. flotation—indicative of growing American interest in this market—and by Anglo America's successful £4,250,000 bearer bond issue in Germany. Canadian producers have benefited from the greater availability of labour resulting from the slow-down in base metal activity. It is significant that this year higher dividend payments have been made by several Canadian gold mining companies, not all of which can be ascribed to development of higher-grade ore.

For the diamond industry—ending the year on a strong note of recovery—the most notable event in 1958 was the acquisition of the Williamson mine in Tanganyika, following the death of its famous founder.

The year now ending has been a particularly interesting one for uranium. Despite the uncertainty surrounding market prospects during the critical period when existing contracts will run out, the uranium industry has continued its meteoric expansion with seemingly undiminished confidence.

Canada's present rate of production is currently about 15,000 tons of uranium oxide a year and South Africa's about half that amount. In Canada, investors have received their first returns in the shape of maiden dividends from Gunnar, Pronto and Rix Athabasca. In the Algoma Basin all 12 mines are at, or near, full-capacity production. In South Africa, uranium earnings have reached peak level and from now on virtually all U mines will have to reduce their average rate of output by a slight amount compared with the average for the past year, though not materially. In Australia, the event of the uranium year has been the official opening of the Mary Kathleen mine.

The year has also brought producers a substantial measure of freedom to exploit commercial markets which, though still at a very early stage of development, is now being rapidly extended.

Of the newer metals, titanium shows signs of recovering from the severe setback caused by the drastic curtailment in U.S. Government orders for metal. U.S. production is once more on the upgrade and new markets are being found not only in the aircraft and missile field but also in the chemical and food industries, where titanium is in growing demand as a corrosion resistant metal. On both sides of the Atlantic great strides have been made by beryllium both technically and in the development of new applications, more especially in the nuclear, aircraft, and guided missile industries.

Despite the low metal prices prevailing throughout much of the year, exploration and development have proceeded apace in all the principal mining countries. Some companies have curtailed or suspended their programmes, but others have taken advantage of the greater availability of geologists and geophysicists to step them up.

Among the most spectacular developments was the start of work on Canada's largest and costliest mining project, namely, development of the huge iron ore deposits of Quebec Cartier Mining Co. at Lac Jeannine in the hinterland of Northern Quebec, which will add over $100,000,000 to the value of Canada's mineral production. Another outstanding event was the formation of the Commonwealth Aluminium Co. to develop Australia's huge bauxite deposits at Weipa, on the Cape Yorke Peninsula.

Nearer home, there has been the official opening of St. Patrick's Mines at Avoca, in Eire, which is being prepared for an eventual output of 4,000 t.p.d. of a pyrite-copper ore. This important mining venture stems from the constructive minerals policy of the Eire Government.

In Britain, a symposium has been held for the purpose of obtaining an authoritative picture of our domestic minerals resources, based on technical appraisal of available data, but it has yet to be seen whether the evidence is sufficiently favourable to warrant further action.

A timely and authoritative reminder that, in spite of the present temporary situation of abundancy, we shall need all the minerals that can be made available, was afforded by twelve international experts who met in Paris on July 7 and 8, purely on a private basis, to consider the problem of future mineral supplies. While agreeing that no immediate shortages appear to be imminent, they drew attention to the serious difficulties which might arise from conflicts between governments, producers and consumers, due to lack of understanding or recognition of the true characteristics of mineral economics.

A distinctive characteristic of mineral exploitation is its inflexibility in production which makes it extremely difficult to achieve rapid adjustment of disparities in supply and demand. This leads to wide variations in cost and price relationships. One of the most serious aspects of this problem is the effect of depressed ore and metal prices on the economies of the producing countries.

The restrictions on exports, though accepted as the lesser evil, have brought unemployment, hardships and loss of revenue to Malaya, Thailand and other tin producers. The fall in copper prices has called a temporary halt to the rapid economic growth of the Central African Federation at the very time when a prospering Africa is of critical importance to the economic defences of the Free World as a whole. Australia, Canada, Mexico and the South American countries have all been affected in varying degree by loss of revenue from metal sales and by the American lead-zinc quotas.

In the absence of loans and extended credits, the reduced earnings of countries predominantly dependent on mining and agriculture must sooner or later be reflected in the order books of equipment manufacturers in the industrial countries. Moreover, frustration and resentment may be caused which provide the Communist powers with immense tactical advantages in the economic war.

Of critical importance, therefore, to the economic defences of the Free World is the vexed question of commodity price stabilization. In view of the superficially divergent interests of the United Kingdom, as the largest buyer of raw materials in the Commonwealth, and of the Dominions and Colonial territories as primary producers, it was heartening indeed that the Montreal Conference should have achieved a substantial measure of agreement, however great the practical difficulties to be overcome.

Prominent among the expansionist measures announced in Montreal were the substantial increases in economic aid to Commonwealth and Colonial territories which Britain and Canada both announced. Events at the I.M.F. and associated meetings, held shortly afterwards at New Delhi, also underlined the growing tempo at which financial aid is likely to be forthcoming from the wealthier countries of the West for the advancement of underdeveloped areas.

The year ends on an encouraging note, with America's economic horizon brightening further; with growing indications that in Britain and Western Europe the bottom of the trough has been reached, if not actually left behind; and with France under her De Gaullist constitution more favourably placed to grapple with the immense political and economic problems associated with the development of the Sahara's mineral wealth.

The more favourable omens now discernible in Western skies in no way lessen the significance of the Russian sputniks which appeared in the heavens during 1958. These man-made constellations were a spectacular reminder that, technologically, Russia is rapidly catching up with the West. Productionwise, the economies of both Russia and China are being expanded at speeds only attainable in countries where financial and manpower resources can be ruthlessly canalized. Russia's new seven-year plan provides for doubling or trebling the output of the key branches of industry, which, of course, include mining. For the first time in history a systematic attempt is being made to exploit China's vast mineral resources and from all accounts the tempo of mining expansion achieved under the Mao regime is without parallel in any Free World country.

Looking into the crystal ball, as is customary at the approaching birth of another year, we foresee the Western powers and the Communist *bloc* competing for the goodwill of the underdeveloped countries by increasing offers of financial and technical aid. Whatever the political outcome, this economic warfare can scarcely fail to give a further impetus to the expansion of mine production on both sides of the Iron Curtain and to the industries on which this must depend.

Graphite Production in Kenya

MODERNIZATION of the plant at Kenya's only producing graphite mine has been accompanied by a drive for world markets which, despite increasing competition from other countries, is reported to show promise of an export trade valued at over £100,000 a year. The mine is situated in the Southern Kitui district, 175 miles from Nairobi on the road to Mombasa, and belongs to Shah Vershi Devshi and Co. Ltd., of Thika, who have played an active part in mineral exploration.

The deposit was discovered in 1950 and production was started on a small scale in 1953. Many difficulties were encountered in the early stages, among the most serious being lack of water. Three boreholes were sunk without success, and water had to be brought in drums from the Athi River, 25 miles away. Communications were also a major problem, and when breakdowns in machinery occurred messages had to be sent by car to Thika, 165 miles away, over very bad roads. Two or three days usually elapsed before the news reached Thika, and it was then necessary for spare parts to be procured from Nairobi before repairs could be carried out.

Conditions improved when it was found that water was available from the Tiva River, about 12 miles south of the mine, and the refinery was moved to the riverside. A road was built by the company which reduced the distance between mine and refinery from 12 to 8 miles. Delay in dealing with breakdowns has been very greatly reduced by the installation of radio-telephone communication between the mine and Thika.

A further problem was presented by flooding during the rainy seasons, when the levels of the Athi and Tiva rivers rose to such an extent that the road from the refinery to the railway station at Kibwezi became impassable. This difficulty was overcome when a bridge was built by the Kenya Government over the Tiva River and roads in the district were improved.

During the first years of production, operations were uneconomic due to the necessity for training labour and also to the "trial and error" methods which had to be adopted initially. Nevertheless, the company's faith in the future of Kenya graphite remained unshaken, and perseverance was rewarded in 1956 by the achievement of commercial scale production, a start being made in the same year with the development of an export trade. An overseas tour by the principal of the company resulted in good business contacts, and production was raised to 100 t.p.m.

At the end of 1957, just as the future seemed increasingly bright, there came a steep fall in the world demand for graphite, which continued into 1958. Average world prices fell by £10 a ton to the present average of £45 c.i.f.

Kenya's own graphite requirements are at present only about 100 tons annually, the principal local users being foundries and glass factories. The company is thus critically dependent on its ability to develop and expand its export trade. In order to study the trend of world markets and stimulate overseas interest in Kenya graphite, Mr. C. D. Malde, a director of the company, set out recently on a four-month tour, in the course of which he visited most European countries, Canada, the United States, Japan, and India. The results are regarded as encouraging, good prospects being seen for high-quality graphite from Kenya in the United States and also in Germany.

The company employs 250 Africans and eight Asians, and is currently treating approximately 1,500 tons of ore annually, producing graphite in a variety of grades, ranging from 50 per cent to 98 per cent carbon, and from powdered graphite to large flakes.

Every effort is being made to reduce the cost of production while maintaining the quality of the product, which, it is claimed, compares favourably with that of graphite from Madagascar and Ceylon. Eight 40 h.p. diesel engines originally supplied power, and these have been replaced by a Blackstock generator permitting a far greater degree of mechanization than was previously possible. If the demand from overseas increased, production could be stepped up to 2,000 tons a year.

Radioisotopes Help Underground Gas Scheme

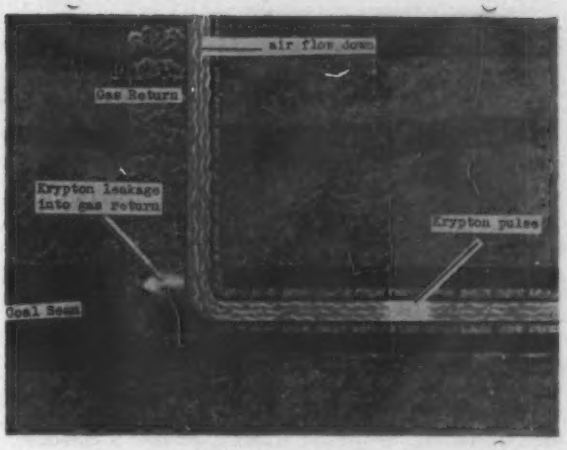
RADIOACTIVITY is helping to solve a number of problems in Britain's scheme for underground gasification of coal. Humphreys and Glasgow Ltd., who are building the pilot plant for the National Coal Board at Newman Spinney, near Chesterfield, have used radioactivity successfully in four ways.

Tracer Tests

In the first method, by tracer tests, the radioisotope Krypton 85, as a tracer gas, has been injected into an airstream to determine the position of leakage in underground piping. It has similarly been used to indicate the rate at which coal is being gasified underground, the occurrence of subsidence of roofing, or the merging of two or more borehole fires.

In checking suspected leakage, the airstream is injected with Kr.85 and piped to the fires below. During and after gasification, gas returns to the surface along the same shaft; monitoring begins immediately at the surface for the return of radioactive gas. If there is no leak, radioactivity is monitored as a single pulse, but if a leakage exists, radioactivity is monitored ahead of the main pulse.

In checking for subsidence, or merging of fires, monitoring is done from adjacent boreholes. Cross-flowing from one borehole to another can unbalance the flow of the gas to the surface, and early warning enables steps to be taken to restore the balance.



The use of Krypton 85 in detecting leakage in borehole piping

The Kr.85 tracer technique has been developed by Humphreys and Glasgow in collaboration with the isotope division at Harwell. They believe it could solve a number of problems in chemical and steam engineering.

Engineers at Newman Spinney found that accurate drilling of a vertical borehole to intersect a horizontal one was difficult with available survey methods. The problem has been solved by using the radioisotope Cobalt 60.

In the second method, a full-sized horizontal hole is drilled and a small-diameter vertical hole sunk to the expected location for intersection. If this misses, a source of gamma radiation is placed in one borehole and a counter in the other. Radiation is then transmitted through the coal barrier and measured. By comparing this value with known standards, already determined, the separation can be found and intersection achieved.

Radioisotope Krypton 85 being inserted for injection into the airstream at surface level

Another problem was the accurate directing of the drilling bit along the seam. Deviations due to irregular strata cause wastage in time and labour. The general layout of coal strata having previously been discovered by vertical and horizontal drilling, an instrument using radioactive cobalt, and developed by the Mining Research Establishment of the N.C.B., provides the third instance of successful operation, and is used to give warning if the drilling bit is in danger of leaving the coal seam.

The operator can alternate his drilling with a probe of this coal-sensing instrument inserted into the borehole. When thin coal is drilled, the operator can redirect the drill before valuable coal is lost. Ultimately it is hoped to position the coal-sensing instrument, emitting gamma radiation, behind the drilling bit.

Coal-sensing research is still being conducted by members of the Mining Research Establishment of the National Coal Board. It is expected that this technique will save valuable drilling and survey time, and decrease the cost of preparing underground gasification systems. Ultimately, no detailed preparatory vertical and horizontal boring will be needed to determine the position of seams.

Control of Drilling

The variation in the amount of natural radioactivity occurring in different strata may be used to enable drilling to be kept on course. Clay, for example, contains up to three times more radioactivity than coal. Near the edges of the coal strata, therefore, a significant increase in radioactivity is recorded. When this occurs during directional drilling, the drill setting can then be modified to maintain the bit in the seam. This fourth instance constitutes an important development in underground gasification technique, which calls for boring horizontal holes of considerable length.

SHAFT SEALING—II.

Shaft Sinking by a New Freezing Method

This is the second and concluding article by Carl Hanfland describing the development of new methods in shaft construction, based on Synoplast special coal-tar pitch

WHILE the special coal-tar pitch Synoplast was being tested for the first time as a sealing medium in shaft sinking, another experiment was being prepared, also including the use of Synoplast, and of great importance for future sinking of new shafts. Here the same rock drilling firm developed a new freezing method for shaft sinking with Synoplast as a sliding medium between shaft tubbing and rock. Based on the experience gained in the first Synoplast sealing operation, considerably improved methods could already be applied.

This shaft sinking project is without question one of the most interesting carried out recently, because it embodies many novel ideas and is based on expert knowledge, so that we may speak of a new process for sinking shafts through very deep layers of quicksand. A short description of the principles of the new method and of the experience gained with it will be of general interest.

The Freezing and Honigmann Methods

Up to now there were essentially two methods for sinking a shaft through not firm and water-carrying strata: the freezing method, and the method named after its innovator, the Honigmann method. In the better known and mainly applied freezing method, the ground is frozen solid with the help of powerful refrigerating plant, with boreholes carrying the cooling agent. The strata thus acquire the properties of solid rock formations and the shaft can be sunk through without difficulty. Then, after constructing sections of about 30 to 50 m. each, cast-iron tubbing is installed. These cast-iron tubbings are fitted together to segments in the shaft and the gap on the side facing the rock is filled up with concrete. After penetrating and lining the entire quicksand layer in this way, the refrigerating machines can be stopped, the strata body thaws, and shaft sinking can proceed by the usual methods.

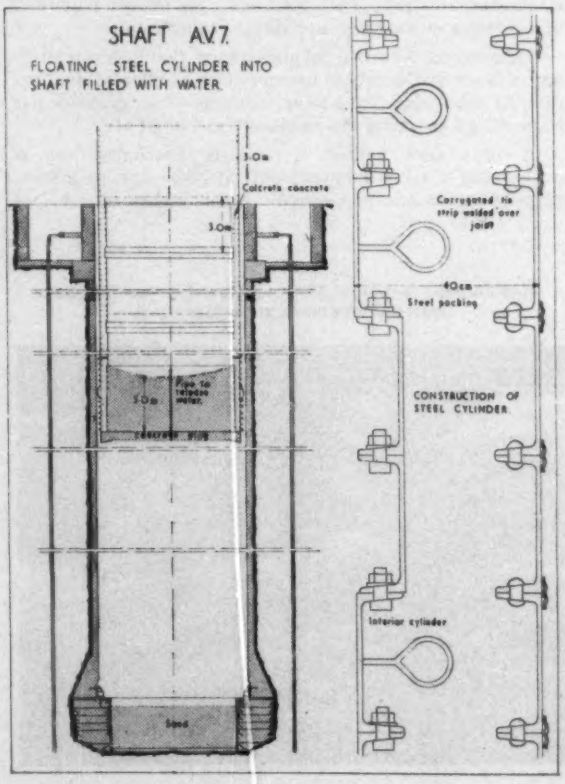
Most shafts of the Ruhr district were sunk by this sixty-year-old method if quicksand layers had to be penetrated. An advantage of this method is that it enables sinking operations to be carried out without difficulty according to the established time plan. On the other hand, the freezing method has a number of drawbacks which are of great consequence in planning relatively deep mines. In such cases it is impossible to obtain absolutely watertight linings by conventional methods, because the joints between the individual segments cannot be made completely tight and, above all, because the shaft column walled with cast-iron tubbing and a back filling of concrete is extremely sensitive to any strata movement. This results in the necessity of leaving a safety pillar of coal around the shaft untouched, the circumference of the pillar increasing with increasing depth of the shaft.

The Honigmann process, developed in the Aachen coal fields, is quite different. Holes are bored through the quicksand layers and widened step by step until the diameter of the inside shaft plus the wall thickness is obtained. The shaft lining is *floated* into this borehole, the procedure being as follows: rings of steel channel sections are formed in the immediate vicinity of the shaft and assembled and riveted together to segments. The lowest segment is fitted with a watertight bottom so as to float, and it is lowered into the shaft boring filled with flushings. All further segments are placed one on top of the other. As the weight increases, the whole assembly sinks deeper and deeper, while its buoyancy causes the top edge of the lining always to remain above the flushing surface level. After the lining is floated into the specified final depth, the space between lining and rock is filled with concrete.

The wallings of all shafts sunk by this method have proved to be very satisfactory. Steel is far more flexible than grey cast-iron and the walling less sensitive to strata movements. Besides, by welding strips of sheet-iron to the segment joints, this type of wall construction can be made watertight for long periods of time.

Credit must be given to the Dutchman de Voijs for further developing this system, using channel sections and thereby obtaining unsurpassed flexibility of the walling while maintaining its strength.

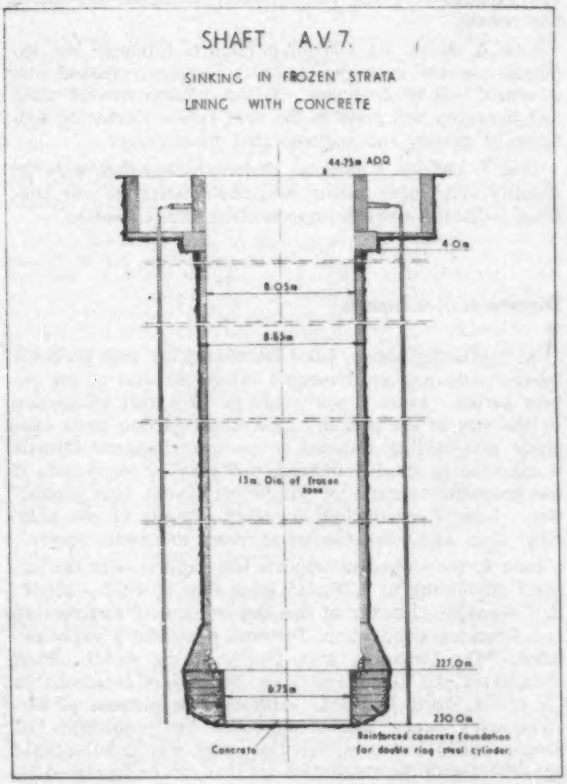
The boring method, however, has a number of serious drawbacks. It can only be satisfactorily applied in soft strata. If harder layers are encountered, previously not recognizable and therefore incalculable, delays may occur. As it is, the shaft sinking progress must necessarily be slow with this method, quite apart from the fact that there is always a danger of the boring deviating from the vertical, or of clay layers swelling and again reducing the diameter of the boring.



While, therefore, the freezing method has the disadvantages of a very fragile lining, the Honigmann system obviously is handicapped by an inadequate and therefore generally unacceptable sinking technique. The recently developed Deilmenn method is a combination of the two methods described above: i.e. the freezing sinking technique and the walling method of the Honigmann system, designed to eliminate the shortcomings of the two old methods. In addition, interposition of a sliding layer between walling and strata makes a shaft safety pillar superfluous.

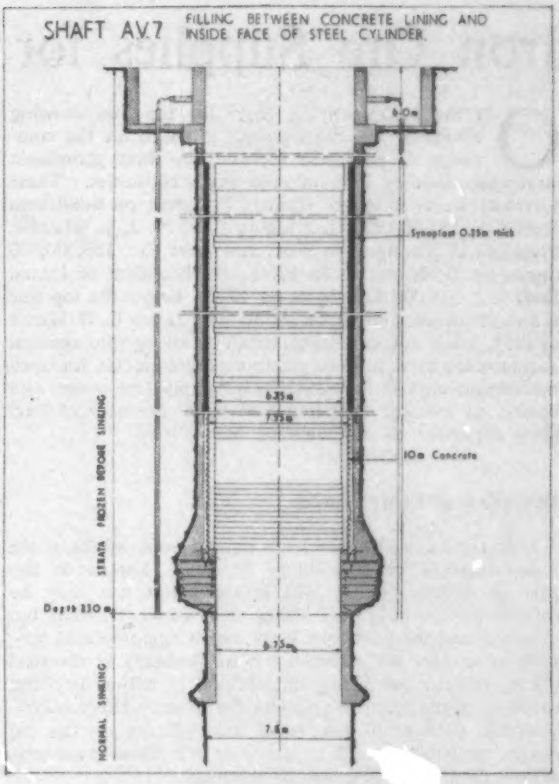
The Deilmenn Method

This new idea was realized for the first time in a shaft sunk at Marl-Hüls. This shaft, of 6.75 m. dia., was sunk to a depth of 250 m. by means of the freezing method. To prevent pieces from detaching themselves from the frozen



strata and falling, the latter was lined in sections of 24 m. depth with a concrete wall 40 cm. thick. At the bottom of the frozen shaft a very thick foundation ring of reinforced concrete was built, destined to carry the walling pillar subsequently to be floated in.

In the meantime, segments for a double-walled steel lining of channel sections had been prepared nearby. The channels were bent to rings and these joined by butt welding. Groups of ten of these rings were assembled to segments of 3 m. height and riveted (outer segments) or bolted (inner segments) together. To obtain at least provisional watertightness, corrugated sheet strips were welded over the horizontal joints of the outer rings. The outer face of the inner segments was provided with anchoring loops for



improved bonding with the concrete to be filled in, the inner face being coated with a corrosion inhibitor.

The lining was floated in as already described. When the prepared bottom segment floated on the water surface in the shaft, outer and inner segments were alternately fitted and the gap was filled with special Colcrete cement. Due to the weight of the fitted segments and to the ballast water, the walling sank step by step as assembled until it rested on the foundation ring.

The first 10 metres at the bottom of the annular space remaining between walling cylinder and outer concrete were then filled with concrete to obtain a solid connection of the walling with the solid rock. The remaining chief part of the annular space was next filled with Synoplast under water through hung-in down-pipes. Based on the experience gained at Dortmund, this method was obviously the ideal solution of all difficulties. The down-pipe was fitted inside the gap and pulled up as the filling displaced the water in the annular space. This prevented all inconvenience due to tar vapour, etc. The sealing joint was extended right above the ground, and filling could be carried out without any setbacks and very rapidly.

This method of filling with sealing compound has two advantages: First, the 25 cm. wide joint ensures a perfectly dry shaft; and secondly, the technological properties of Synoplast provide for an ideal sliding layer. This property of the sealing compound is indispensable when systematic working of the coal seams has reached the vicinity of the shaft and the strata begin to detach themselves from the shaft walling.

To complete the picture, it should be mentioned that after the described operations were completed, the ballast water was pumped out of the shaft and the reinforced concrete bottom pierced. Subsequently, shaft sinking and lining below the quicksand layer was continued by conventional methods.

Iron Ore Supplies for the U.S. Steel Industry

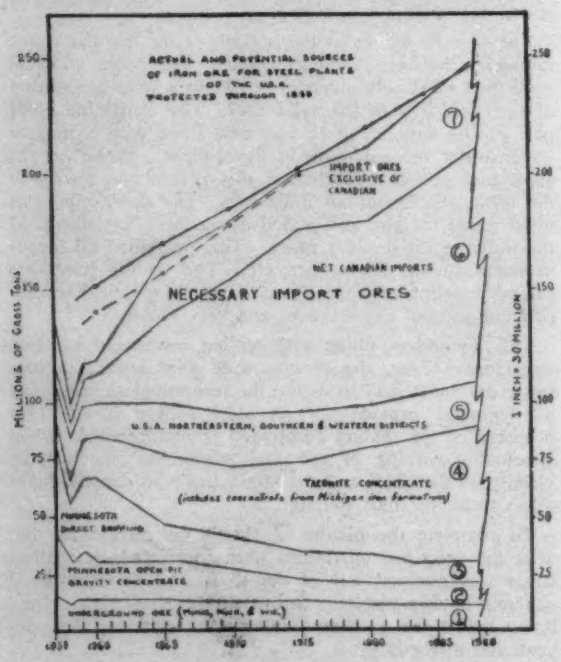
ON the accompanying chart the top line showing estimated ore requirements is based on the composite of published forecasts by three prominent steel executives in 1955 of steel ingot capacities. These forecasts were by A. B. Homer, President of Bethlehem Steel Co., 185,000,000 steel ingots by 1970; J. L. Mauthe, President of Youngstown Sheet and Tube Co., 180,000,000 ingots by 1970; and P. D. Block, Jr., President of Inland Steel Co., 216,000,000 ingots by 1980. Below the top line is a dashline representing an estimate by James C. O. Harris in 1957, made in considerable detail by taking into account an increased blast furnace yield, ore requirements for open hearth and electric furnaces, scrap supply and usage, and finally, an average operating rate of 90 per cent of steel plant capacities as estimated by Mr. Harris.

Discussion of Chart Sources

Line 1 shows shipments from underground mines of the Lake Superior District, U.S. This ore, known in the past as direct shipping, will in the future not only be treated by crushing and sizing the coarser fraction but screened and the fines to a large extent agglomerated possibly at or near the mines but more probably at the steel plants, thereby permitting an increase in reducibility and avoiding degradation in shipping the sinter. There is considerable tonnage of reserve of this rich ore on the old ranges, probably enough to last to or into the next century, with very gradual decrease in shipments.

Line 2 shows shipment of gravity concentrates from medium rich oxidized iron formations, which will largely be treated without fine grinding. On account of great developments in recent years in treatment plants, reserves are larger than formerly estimated.

This chart was prepared by Verne D. Johnston, for a lecture delivered at the University of Minnesota



Line 3 shows shipments of open pit ores, direct shipping, but here also the coarse and fines will be separated by screening and shipped separately as is being done today. The coarse fractions will be sized and the fines will be agglomerated or concentrated by some process such as direct reduction.

Line 4 shows concentrates produced from low-grade Lake Superior iron formations (20 per cent to 30 per cent metallic iron) known as taconite on the Mesabi Range and jasper iron formations on the Marquette Range in Michigan. This product will also form a considerable portion of other U.S. reserves; for instance, that of the large orebodies in Missouri and Montana now being explored and developed.

Line 5 shows other shipments from not only those states mentioned above but also direct shipments from Nevada and Montana. These will probably continue throughout this period.

Line 6 shows net Canadian imports (imports less exports). In the early years direct shipping, crushed and screened, will predominate. Rapid development of plans and financing will yield in the near future increasing tonnages of gravity and agglomerated concentrates.

Line 7. Africa, Chile and Venezuela, together with the recently announced major Brazilian enterprise, will continue to furnish sizeable imports other than Canadian.

Discussion of Estimates

As mentioned above, line 1 has a long life with probable modest reduction in shipments before the end of the 30-year period. Lines 2 and 3 will be very near exhaustion by the end of the period. Line 4, production from low-grade iron-bearing material in the Lake Superior District is expected to steadily increase and may be augmented if non-magnetic taconite of Minnesota comes into production. Line 5, production in other districts of the U.S., other than Lake Superior, is expected to remain steady.

Line 6, net Canadian imports less exports with the exports amounting to 3,731,315 gross tons in 1957. Mr. P. E. Cavanagh, Director of the Department of Engineering and Research Foundation, Toronto, presented a paper entitled, "On Canadian Iron Ore", at the AIME, Blast Furnace, Coke Oven and Raw Material Conference in Cleveland, April 14, 1958. Although the purpose of Mr. Cavanagh's paper was to compare the reducibility of various world iron ores, Mr. Cavanagh was in substantial agreement with the amount of ore that can be furnished by mining operations in the U.S., namely, with difficulty, 100,000,000 tons per year; however, Mr. Cavanagh's admittedly conservative estimates show a possible maximum of 40,000,000 tons for export from Canada in 1980 via the Great Lakes whereas the chart shows 80,000,000 tons to be imported from Canada in 1975 and 1980. Mr. Cavanagh estimates that less than one-half of the 40,000,000 tons will be direct shipping type such as Labrador and Steep Rock.

Obviously, this is too conservative. If Canada should adopt a policy of restricting outside investments, which would restrict availability of ore for shipment to the U.S., then Venezuela and Brazil can readily increase shipments to make up any needed difference. The proposal of some Congressmen for high tariffs or restrictions on the amount of import ore is inimical to the development of expected expansion in the U.S. steel industry.

MINING MISCELLANY

A team of geological experts conducting surveys in central Kalimantan, Indonesia, have discovered diamond, gold, nickel, mica, coal, and other mineral deposits there, but development of the area is held up for lack of labour. According to the Kalimantan Immigration Office, not a single migrant has come to central Kalimantan this year.

*

Near the town of Wau, in New Guinea, a gold strike has been reported by New Guinea Goldfields. The extent of the field, which is located near Anderson Creek, about two and a half miles from Wau, is not yet known. Mr. F. J. Leydin, the company's general manager, has said that it would take a lot of work and time before it could be found how rich the field was.

*

Efforts are being made to step up production of the coal mines in the Nong Son area of South Vietnam, some fifty miles south of Tourene. It is hoped that up to 120,000 tons of coal annually will be extracted by 1961. These mines are now under government control.

*

Commonwealth Aluminium (Proprietary) has been granted a special mineral lease of about 22 sq. miles in the Grove Peninsula, Northern Territory of Australia. Mr. P. Hasluck, Minister for Territories, said that the area was known to contain substantial tonnages of bauxite, although more testing work was necessary before the commercial importance of the deposits could be determined.

*

The discovery of a "promising" deposit of nickel at Uusi Haapala Saaminki, Finland, has been reported.

*

Six Soviet experts have been inspecting the mineral resources of the Mount Kromong area, near Palimanan, west Java, Indonesia, under the sponsorship of the State Planning Bureau. They were particularly interested in phosphate and sulphur deposits.

*

Following the mission to the Dominican Republic last May of representatives of the Japanese Mitsui Mining Co., a group of this company's mining engineers is visiting the Dominican Republic in December to examine iron ore deposits. The deposits are at Hatillo. The main iron ore area is near the port of Haina, where Mitsui company boats already call.

*

Wemco has announced the availability of a new booklet describing flotation equipment. In eight pages, it describes the principle of the flotation process for selectively separating finely divided mineral particles, as well as the design, construction, and operating characteristics of the Wemco Fagergren Flotation Cell. Copies of the booklet may be obtained by writing to Wemco, 650 Fifth Street, San Francisco, California, U.S.A.

*

The Ministries of Finance, Development, and Agriculture and Mines of Colombia, have expressed their interest in the formation of a company to take charge of the exploitation of coal in the Cali region. The company would undertake the development of the railway to Buenaventura and of the loading facilities at that port, so that the export of coal could be undertaken on an adequate scale.

*

A haulage development rate record, being an average advance of 66.1 ft. per working day, was achieved on the 1,350 level recently on the Copperbelt. An Atlas Copco pneumatic loader made this high-speed development possible. Air pressures up to 110 lb. per sq. in. were provided by an Atlas Copco booster compressor. The usual underground average is 75 lb. per sq. in.

*

Traditionally, new mines are commissioned in Poland on the day of "Barburka" (Miners' Day). The shallow coal mine Jezor 4th started work on December 3, the eve of Miners' Day, giving an initial output of 100 tons per day. A big coal washer was also commissioned in the Walenty-Wawel coal mine and work started at the two hard-coal mines Porabka and Mszany.

*

Two New Zealand miners, Mr. I. W. Kenny and Mr. P. G. Watson, have established a gold mining claim 50 ft. under water in the Waikahaho Valley in the South Island. They have sunk a 72 ft. shaft, the walls of which, using aqualungs, they are strengthening with cement. When this work is finished, the shaft will be pumped dry and a tunnel will be driven at right-angles to where the gold is believed to lie.

*

Exploration of the newly discovered copper deposits in the vicinity of Glogow is becoming increasingly extensive. The newly discovered deposits, other than copper, cannot be accurately estimated before 1960, when the geological research will have been completed. Copper is not the only discovery in the Glogow area, in Lower Silesia. Silver, nickel, and vanadium, as well as other valuable raw materials have also been found.

*

The report on the preliminary reconnaissance survey of the Wynad gold field in Madras State by Mr. S. Narayanaswami, geologist of the Geological Survey of India, states that the "gold lodes of the area are generally low grade". "The high gold values", the report says, "are very sporadic and patchy in distribution, and are generally associated with high pyritic content of the lodes. The payable sections of the lodes in various mines are generally small, and are interspersed with longer sections of low-grade ore." The geologist has, however, made some recommendations to be carried out in future work, and has stated that the economic recovery of gold from certain zones should be studied in any future programme of sampling.

*

To celebrate fifty years of continuous publication, the *Chemical Engineering and Mining Review* has published a special golden anniversary number. Its contents include a survey of the Australian mining industry, 1908-58, by M. R. McKeown, as well as articles on the history of mining in Victoria, N.S.W., Tasmania, South Australia, and Western Australia during the same period, and of developments in coal mining and metallurgy. Australian mineral development is reviewed by Dr. J. A. Dunn.

PERSONAL

Mr. W. H. A. Lawrence, for many years closely connected with Central Mining, Rand Mines Group, and chairman of the Argus Newspaper group, has died in Johannesburg at the age of 64. Mr. Lawrence was president of the Chamber of Mines in 1942 and 1944.

*

Mr. G. H. N. Todd has been appointed chairman of Burma Mines Ltd., in succession to the late Mr. A. T. W. Paine. Mr. C. T. Fry and Mr. D. A. H. Baer have been appointed directors of the company.

*

The death has occurred of Mr. W. E. Wright, F.C.S., director of the Pyrene Co. Ltd., who was responsible primarily for the Metal Finishing Division of the organization.

*

At a meeting of the Council of the Gauge and Tool Makers' Association, Sir Stanley J. Harley, B.Sc., M.I.Mech.E., M.I.Prod.E., was appointed president for the year 1959. Sir Stanley is chairman and managing director of Coventry Gauge and Tool Co. Ltd.

AGENCIES WANTED

Lafferty and Co. Ltd., of P.O. Box 572, Ndola, Northern Rhodesia, are seeking agencies for mining safety helmets (fibre glass and/or plastics), safety goggles and visors. Suppliers interested should write direct to Lafferty and Co. Ltd., at the same time notifying the United Kingdom Trade Commissioner, P.O. Box 1514, African Life Building, Main Street, Bulawayo, Southern Rhodesia, that they have done so. Ref. E.S.B. 30639/58. Telephone inquiries to Chancery 4411, extension 776 or 866.

CONTRACTS AND TENDERS

Further contracts have been placed by the National Coal Board, West Midlands Division, No. 1 (North Staffordshire) Area, with A.E.I. Heavy Plant Division, Rugby, for four winder equipments very similar to those already on order for Wolstanton Colliery. The new orders are valued at nearly £700,000. Each winder consists basically of a 3,300 h.p. 20-pole d.c. motor which is overhung from the winder pulley shaft. The associated motor generator set comprises a 2,400 kW. generator driven at 500 r.p.m. by a 3,000 h.p. slip-ring induction motor. Closed-loop control and winder protective equipment are also included.

Machinery and Equipment

New Equipment For South Crofty

Head Wrightson Stockton Forge Ltd., a subsidiary of Head Wrightson and Co. Ltd., have recently supplied a rod mill, screen and auxiliary equipment to replace the existing Californian stamps, which have been in use at South Crofty mine for many years. The main purpose of this modernization is to keep the amount of slimes to a minimum for subsequent treatment.

The plant is designed to reduce the $-\frac{1}{4}$ in. granitic tin ore to all -20 mesh product at the rate of 15 l.tons per hour, with an estimated circulating load of 150 per cent.

Two 16 in. horizontal belt conveyors collect the $-\frac{1}{4}$ in. ore from the existing bins and deliver direct to the rod mill feed chute. The mill discharge is taken by a 14 in. bucket belt elevator and delivered to a spreader chute, and thence to a 4 ft. by 8 ft. Sherwen screen with 14-mesh screen. The screen oversize returns to the mill and the undersize is pumped for classification and tabling.

The rod mill is 6 ft. dia. inside shell by 10 ft. long inside end liners. The mill speed is 23.3 r.p.m. and the drive consists of a cast steel machine-cut girth gear, driven through pinion, countershaft and texrope drive from a 200 h.p. by 735 r.p.m. motor.

THE PRIME CONTRACTOR GOES OVERSEAS

What may well prove to be a development of considerable significance in the promotion of British mining machinery sales in under-developed areas of the world, where the limited mining and purchasing know-how which is available may already be over-committed, is the tendency for some firms, which have been acting in recent years as prime contractors to the N.C.B., to begin to turn their attention to similar opportunities in overseas markets.

These prime contractors, long familiar in civil engineering but a relatively new feature of British mining, have tended to be firms which were themselves substantially interested in the manufacture of one or more of the principal items in the mine equipment programme. There is, however, no inherent reason why this should be so, as the essential function of the prime contractor as developed by the N.C.B. has been to give effect to the Board's blueprints for new pits in respect of surface installations and the sinking and equipping of shafts. The services required have been primarily those of preparing schedules for tender, assigning contracts and supervising the quality and timing of sub-contractors' plant and machinery deliveries as well as the final on site erection.

Above is the Aveling-Barford type SN Dumper, 27-ton payload, powered by Rolls-Royce 400 b.h.p. 8-cylinder diesel engine, with air-assisted clutch and mechanical transmission which gives the unit a speed range of from 3 to 30 m.p.h. Alternative engines by Rolls-Royce and Cummins give forward speeds from 4 to 31 m.p.h. Tipping is by twin, hydraulic, two-stage telescopic rams universally mounted to both body and chassis. A full tip of approximately 70 deg. is achieved in 12 secs. Below, a simplified layout showing the equipment supplied to South Crofty by Head Wrightson Stockton Forge Ltd.

One of the organizations which is capitalizing on its experience with the N.C.B. and is now re-deploying its services to assist the mining industry overseas is Simon-Carves Ltd., who have recently published a brochure entitled *Service to the Mining Industry*. In it are described the range of integrated contracting and engineering services which they can offer alike for metal mining and coal mining.

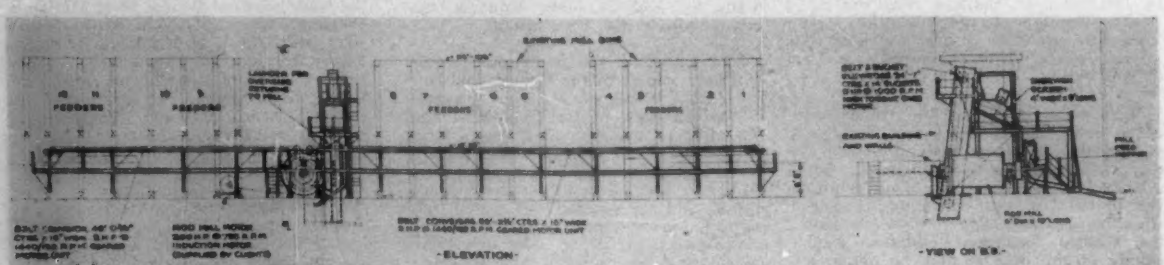
These are the kind of particulars which should be in every British Commercial Attache's and Trade Commissioner's file as well as in those of the various Commonwealth and international organizations through which financial aid is being injected into the underdeveloped areas of the world.

Increasingly, British engineering know-how and manufacture will have to be ready to sell themselves on a "package" basis in these countries, and increasingly those in Britain whose task it is to channel the taxpayers' money into these vital projects must come to realize that signing the "aid" cheque is but a preliminary step in the process of spreading British influence through British technical aid and machinery.

SAVINGS IN TUNNEL DRIVING

Slusher train equipment manufactured by Sanford-Day now promises impressive savings in tunnel driving. The equipment includes a loader, an S-D slusher train, and a locomotive. Only two operators are needed, one for the loader and the other for the slusher. The train consists of Sanford-Day bottom automatic dump cars of any required number.

The cars are dumped when the complete round is mucked out, there being no necessity for car switching or for extra men. The overlapping ends on the slusher cars, permit the slusher to move spoil from the first car to all the other cars, and it is estimated that 1 ton to 1½ tons per min. can be loaded with this machinery system.



Metals and Minerals

Magnesium Outlook Improves

With the closing down of one plant and the progressive scaling down of the operations rate early in 1958 to some 26 per cent of available capacity, United States production of primary magnesium has latterly been in the region of 1,800 s.tons a month. This resulted in an output of 5,435 tons of ingot for the third quarter of the year, according to the Bureau of Mines, U.S. Department of the Interior, which was the lowest quarterly figure for the year to date. Total production in the first nine months of 1958 amounted to 24,493 tons, as compared with 62,973 tons produced during the corresponding period of last year.

Third-quarter demand, as measured by ingot shipments, was about 24 per cent below the figure for the same period last year, but for the second quarter in succession it exceeded current output.

With a rise in the demand for magnesium, now believed to be in the offing, the coming year is expected to witness the advent of a new primary producer in the United States domestic industry, namely: the Alabama Metallurgical Corporation, which is currently constructing a $3,500,000 plant near Selma, Alabama. This plant will use dolomite as the basic raw material for producing primary magnesium by the ferrosilicon process. The original plans called for a plant with a rated capacity of 10,000 tons. No figures have recently been announced as regards either capacity or estimated initial output, but it is understood that the latter is likely to be considerably less than the original figure.

As originally planned, the Alabama Metallurgical Corporation would have been jointly owned by Brooks and Perkins, Detroit, a major United States producer of magnesium mill and other products, and Dominion Magnesium Ltd., of Toronto. Dominion has ceased to be a participant, however, and its place has been taken by Calumet and Hecla, a United States company which has acquired a substantial interest in the project.

Dominion Magnesium recently reported an order from the German manufacturers of the Volkswagen for the supply of approximately 100 tons of magnesium metal a month during 1959. It is reported that the plant will consume up to an estimated 11,000 tons of magnesium next year, and Dominion officials are hopeful of greater sales in the future, since Volkswagen is believed to be planning the establishment of factories in other countries. Volkswagen's example has also led car designers in other countries to consider more seriously than ever the weight savings, simplicity of pressure die casting, ease of machining, and other advantages of magnesium.

The Volkswagen order must be particularly welcome to Dominion Magnesium in view of the stiff competition which has been encountered from Norway and Italy, the more so as relatively high tariffs are making it difficult to place Canadian magnesium in United States markets.

Mr. Calvin Campbell, a vice-president of the Dow Chemical Co., has stated that, when magnesium attains a competitive position after casting problems have been solved, the automotive industry will take up the entire production of the Freeport plant. This is the Dow plant which has been set up to extract magnesium from sea water.

DEVELOPMENTS IN NICKEL USAGE

Developments in nickel usage were reviewed by Dr. John F. Thompson in his survey of the nickel industry in 1958. The greater availability of nickel during the year brought with it changes in applications, some new and others a restoration of older uses which had been in effect before the period of restricted civilian supplies. Free World nickel consumption by fields in 1958 is estimated as follows: stainless steels, 28 per cent; engineering alloy steels, 16 per cent; nickel speciality alloys, 16 per cent; foundry products, 15 per cent; electroplating, 14 per cent; copper and aluminium base alloys, 6 per cent; and miscellaneous, 5 per cent.

During 1958, the total production of stainless steel dropped substantially, but the percentage of the nickel-containing grades showed some increase relatively to the total. In the United Kingdom, Sweden, and other European countries, production capacity for stainless steel was increased. With a plentiful supply of nickel assured for future production, it is expected that the use of nickel-containing stainless steels will continue to increase in all fields of application, particularly in those which for a period have remained either dormant or incompletely developed. Some of those fields which are receiving the greatest attention from steel producers are household products, automotive functional trim, and architectural applications.

Free availability of nickel has made it possible for alloy steel consumers to return to the higher nickel-containing types of established alloys. An example of the use of nickel alloys in transportation is in the modernization programme of British Railways, where nickel-chromium case-hardening alloy steel is being employed for diesel locomotive bearings. An ultra high-strength nickel-containing alloy steel is being used in increasing quantities for landing-gear components of new jet transport aircraft, as well as in sheet form for various parts of missiles.

Nickel, nickel-copper alloys, nickel-chromium alloys, and the wide range of established nickel-base alloys continue to be specified where stress and corrosive environments impose severe service conditions. The high nickel precipitation-hardened and other related alloys provide the strongest cast and wrought compositions commercially available for such highly stressed items as turbo-jet rotor blades for operation at high temperatures. In the more advanced propulsion systems, high-nickel alloys are especially well suited to resist the corrosive action of the new boron-containing high energy fuels. The first so-called manned satellite, the "X-15", built by North American Aviation, represents the first use of a heat-resisting alloy as fabricated sheet metal skin capable of withstanding the weakening effect of aerodynamic heating. "Inconel X" nickel-chromium alloy was chosen as the most suitable material for construction of the body of this spaceship.

The new commercial aircraft are important users of nickel alloys—the engines use at least three times as much nickel as piston engines. It is estimated that a typical large jet-liner employs about two tons or more of nickel in various alloys, the engines accounting for approximately one and a half tons.

There has been an increased use of abrasion-resisting nickel-chromium cast irons for grinding and crushing equipment in plants handling ores, cement, coal and coke, especially in the United Kingdom, Germany, and Scandinavia. New techniques in casting and heat-treating grinding balls made of these alloys show promise of wider adoption of these cast irons for this application in the cement and mining industries.

A good potential market, dependent on both product and market development, is the nickel-cadmium storage battery. Taking advantage of a nickel-carbonyl powder specially developed for the purpose by Inco, various battery manufacturers are now expanding their facilities to develop and enlarge this market.

Consumption of nickel in recent months has shown an improvement over the low levels touched earlier in the year, and it is expected that this situation will continue into 1959.

INCO'S STRIKE SETTLED

A settlement has been reached in the strike at International Nickel's Sudbury and Port Colbourne plants after four days of Government-sponsored negotiations. The terms of the settlement cannot yet be disclosed. Inco's Canadian mines were shut down on September 24, when workers walked out after negotiations for a new contract broke down. Apart from nickel, the 87-day strike has resulted in a loss of about 10,000 tons of copper monthly, as well as platinum and the various by-product metals.

ALCAN CUTS PRODUCTION

The Aluminium Co. of Canada, the main operating subsidiary of Aluminium Ltd., is reducing its smelter production in January by 10 per cent. This is the third reduction announced by the company this year and brings the annual rate of production down to 500,000 tons, compared with the present installed capacity of 770,000 tons. The decision emphasizes the difference in the trend of economic activity inside and outside the United States. It is because demand for aluminium outside the United States still remains slack that Aluminium Ltd., with its world-wide interests, is again reducing its output in contrast to the major United

Owing to the Christmas holidays, our regular market features do not appear this week. They will be resumed in our next issue.

States producers, who have recently stepped up their activities. Since Aluminium Ltd. sells much of its output to fabricators, it by no means follows that the extent of the cut reflects a corresponding decline in the outputs of its United Kingdom subsidiaries, Northern Aluminium and Aluminium Union.

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The acting Minister for Geological Research of the Soviet Union, Boris Yerofediev, writing in *Red Star*, has stated that such large deposits of aluminium-bearing materials have been found in the European section of the Soviet Union, in western Siberia, the Krasnoyarsk area, Armenia and Azerbaidjan, that the U.S.S.R. would be able to raise its output of this metal 2.8 times by 1965.

The Soviet Union's latest major aluminium plant was expected to go into operation last month in Stalingrad.

I.T.C. APPROVES BARTER TRANSACTIONS

The International Tin Council has approved arrangements whereby certain stocks of tin held in producing countries may be transferred through barter transactions to the strategic and critical material stockpile of the United States. This is the main point of the communiqué. The Council said permitted stocks in the producing countries concerned would be reduced by like amounts. No change was being made in the total permissible export amount for the six producing members of the agreement, during the fifth control period, January 1 to March 31, 1959, fixed at 20,000 tons, at the last meeting of the Council. The negotiations with the Soviet Union were expected to be completed before the end of the year. The Council accepted with much regret the resignation, effective at the end of April, 1959, of Mr. W. K. Davey, the buffer stock manager. The Council had appointed as his successor Mr. J. B. M. Lochtenberg, the present deputy buffer stock manager. The next meeting of the Council will be held on February 17, 1959.

U.S. TANTALUM CAPACITY

The Business and Defence Services Administration of the Department of Commerce has announced that the expanding domestic tantalum industry in the U.S. now has the productive capacity to meet demand, which is growing, for such uses as electronic units in guided missiles and aircraft and chemical equipment. The industry has grown in two years from one company to seven producers with ten facilities. Capacity is now estimated at about 450,000 lb. of powder annually, which is converted into pellets, sheet and other forms.

The defence programme is expected to give a further impetus to production in the near future. Demand may also be stimulated by reduced prices resulting from present efforts to develop a wider range of uses for the co-product, columbium, contained in tantalum-columbium concentrates.

TURKISH CHROME STOCKS

Stocks of chrome ore have been accumulating in Turkey, since producers are having difficulty in finding markets. Producers are pressing for the export premium of T.L. 2.10 to the dollar to be raised to T.L. 6.20.

Mining Finance

Half-speed for Malayan Tin

The statements which appear at this time each year from the chairman of Malayan Tin Dredging and Southern Malayan Tin, the late Mr. E. V. Pearce, are always of more than routine interest. Mr. Pearce had an experience of tin, both in Malaya and elsewhere, extending over more than 60 years, and covering all branches of the industry. Fortunately, Mr. Pearce had prepared his review for 1957-8 shortly before his death, and for this year, at least, we are not deprived of the benefit of an experience in this field second to none. Extracts from his statement appear on opposite page.

The year 1957-8 was, of course, an exceptionally full one for both Malayan Tin and Southern Malayan. In particular, it was the first in which the impact of output restriction was felt, and in spite of this the average sterling equivalent of the Singapore tin price was only £712 15s., almost £50 lower than in the previous twelve months. As a result, Malayan has had to shut down two of its four dredges, while Southern Malayan, after bringing a new sixth dredge into operation in August, 1957, was forced to shut down three others in the early part of 1958. Neither can the companies look forward to better things in the financial year now under way, because in spite of the improving outlook for the metal, the full year will be affected by output restrictions, against only six months in 1957-8.

The reaction of these two companies, like that of most of the more progressive metal producers of the world, is to look two jumps ahead, to the time when the problem will not be restriction of output to balance demand, but the more fundamental question of replacing the world's declining sources of metal, and, having replaced them, of exploiting them in the most economic way possible.

The contribution of Malayan and Southern Malayan Tin, in company with others of the Tronoh Malayan group, to the solution of these inter-related problems is largely made through the agency of two unquoted companies, Aokam Tin and Tromal Prospecting. This latter company has been prospecting in Thailand for some time, and although no detailed results have been published, it is known that preliminary results have been sufficiently promising to justify further investigation.

Aokam Tin is the company which the group is using to experiment with a grab dredge. This form of operation is new to tin mining, and it is unfortunate that output restriction should come into force so soon after dredging began, making it impossible for the company to pay for its operations without help from its sponsors in spite of the comparatively high-grade ore it is working. Teething troubles are still being experienced—indeed, it is still by no means proven that the method will be an economic success on less suitable ground—and output restriction has meant that it has been impossible to run the dredge continuously over long periods of time. It has, however, been possible to utilize the periods of closure to modify the plant.

Of more immediate interest to shareholders in Malayan tin producers is the recent news that company tax in the Federation is to be raised from 30 per cent to 40 per cent. This, it should be pointed out, is by no means as severe an impost as might be thought. Firstly, the tax position for mining companies in Malaya is, by world standards, by no means unsatisfactory, even at the new rate of company taxation. Again, the increase in the amount companies will have to provide will only go a small way towards offsetting the savings which O.T.C. treatment now brings in terms of reduced U.K. taxation.

Above all, the increase will produce a corresponding increase in the net rate used for double taxation relief purposes, so that those who enjoy (if that is the right word) an effective rate of U.K. tax high enough to take advantage of D.T.R.—and Malayan Tin shares are no field for the small investor—will recoup some of the loss from the Inland Revenue.

MODERNIZATION AT LAKE VIEW

Over the period 1954-57, Lake View and Star, the Westralian gold producer, spent almost £250,000 on installing electric winding equipment at three of its shafts: the Associated, Ivanhoe, and Lake View. The operation was a decided success and the resulting fall in working costs is expected to reach 1s. 6d. per ton when full benefit is felt. This, however, was only the first phase of a programme estimated to cost a total of £475,000.

Before embarking on the remainder of the programme, the board decided to commission a special geological examination of the mine in order to decide whether the life remaining was sufficiently lengthy to justify the further £234,000 to be spent. The result of the examination proved favourable and the programme, which includes the electrification of the Chaffers winder, will now be completed.

The news that the company is prepared to embark on a capital programme of this magnitude after a producing life of more than fifty years throws new emphasis on the qualities of the Westralian mines as investments. Taking into consideration the official forecast that Lake View's 2s. 6d. dividend rate will probably be maintained while the capital programme is being completed, the current yield of about 10.5 per cent is by no means low.

GHANA MINING POLICY

A further statement by the Ghana Government was issued in London last week. It said: "The present policy of government is to do everything possible to establish firmly the mining industry in Ghana and to that end to continue giving assistance to those mines who are in difficulties.

"The government has no intention of changing the present principle of taxa-

MALAYAN TIN DREDGING
and
SOUTHERN MALAYAN TIN DREDGING

The Annual General Meetings of Malayan Tin Dredging, Ltd., and Southern Malayan Tin Dredging, Ltd., were held on December 19 in London.

Mr. F. G. Charlesworth, a director of the company, presided.

The following are extracts from the Statements prepared shortly before the death of the late Chairman, Mr. Ernest V. Pearce.

Malayan Tin Dredging Ltd.

The Company's production and sales of tin concentrates have been curtailed as from December 15, 1957, when Export Control commenced.

The four dredges operated until April, 1958, when two of them were closed down. During the year recovery was 1,849 tons, of which 1,589 tons were sold, the balance of 260 tons being retained on account of permitted stocks.

Of the 1,589 tons of concentrates sold during the year, 925½ tons were produced and sold during the first 5½ months of the year when exports were unrestricted. In the remaining 6½ months, when Export Control was in force, the Company was permitted to sell 663½ tons. During the first six months of the current year (July to December, 1958) the Company is permitted to sell 563½ tons and permitted sales during the first quarter of 1959 will be at a slightly lower rate.

As is to be expected with restriction of production and the consequent closing down of dredges and reductions in the numbers of staff and labour employed, there have been reductions in mining expenditure. Every effort is being made to reduce this expenditure still further in these difficult times.

Satisfactory progress is being made with the erection of the new dredge on the Company's property at Kampong Gajah and it is expected that it will be ready for operation in July, 1959. We are assured that this dredge will, when ready, receive an Assessment and Quotas under the Tin Control Regulations.

Prospecting by Tromal Prospecting Ltd., which is now wholly owned by the associated companies of the Tronoh-Malayan Tin Group, was continued in Siam throughout the year. A number of properties were investigated and some of the preliminary results obtained were sufficiently promising to justify further investigation.

The offer, made in September, 1958, to purchase 314,667 shares in Kramat Pulai Ltd. at a price of 1s. 6d. in cash for each share of Kramat Pulai Ltd., plus the allotment of one share of the Company for every three shares of Kramat Pulai Ltd., was accepted by the holders of 302,477 shares. Steps are now being taken, under the provisions of the Companies Act, to acquire the 12,190 shares in respect of which acceptances were not received. On the acquisition of those shares Kramat Pulai Ltd. will become a wholly owned subsidiary of the Company.

The assets of Kramat Pulai Ltd. include the right to a Mining Lease over approximately 1,050 acres of mining land at Kampong Binjai, immediately adjacent to the Company's property at Kampong Gajah. Although the property is low grade it can be mined by the Company's large capacity dredges when conditions warrant its exploitation and it will therefore constitute a valuable addition to the Company's ore reserves and to the life of its properties.

On August 31, 1957, the Federation of Malaya became an Independent Sovereign State within the Commonwealth. It has been particularly gratifying to note the assurances which have been given by the Prime Minister and other Ministers, that capital invested in the country, will receive fair and equitable treatment.

Great strides have recently been made towards ending the Emergency which has existed for so many years and I believe that we can now look forward to the time when Communist terrorism will, for practical purposes, have been eliminated.

The long term outlook for tin remains good and when conditions of prosperity return, your Company, with its valuable properties and modern equipment, will be well placed as any to share in the benefit.

Southern Malayan Tin Dredging Ltd.

From August 21, 1957, six dredges were in operation until February 28, 1958, when No. 5 dredge on Teja Section was closed down. For the same reason No. 1 dredge and No. 2 dredge on Tanjon Tualang Section were closed down on April 4, 1958, and for the remainder of the year only three of the Company's dredges were operated.

During the year recovery was 3,225 tons, of which 2,807 tons were sold, the balance of 418 tons being retained on account of permitted stocks.

Of the 2,807 tons of concentrates sold, 1,770 tons were produced and sold during the first 5½ months of unrestricted operations. In the remaining 6½ months, when it was necessary to restrict production the Company was permitted to sell 1,037 tons. During the first 6 months of the current year (July to December, 1958) the Company is permitted to sell 880½ tons of concentrates. Permitted sales during the first quarter of 1959 will be at a slightly lower rate.

Plans for the equipment of the Degong Road property by the transfer to it of No. 5 dredge are for the time being in abeyance owing to Restriction.

MINING FINANCE—*Continued*

tion on profits and certainly had not even considered the proposal for a special levy as had recently been suggested in certain quarters."

NCHANGA MAINTAINS ITS INTERIM

Although the news that Nchanga is maintaining its interim payment at 3s. is by no means unsatisfactory in itself, it would be unwise to draw conclusions from it relating to Copperbelt profitability generally.

Nchanga, it must be remembered, is something of a special case. Until recently, the company has had to devote a great deal of income to satisfying the needs of its £7,000,000 expansion programme. This has meant that, although the 1957-58 appropriation for capital expenditure was sharply reduced, the degree of cutback was by no means as great as will be possible in the current year's accounts, now that the scheme is virtually completed.

Thus Nchanga may well have found itself able to declare a dividend higher than that actually warranted by the current level of profits. Support is lent to this view by the board's action five months ago, when an annual dividend costing £3,500,000 was declared from income totalling £3,395,911—a signal that the company was prepared not only to discount ahead the generally improving trend of the metal price, but also to take account of the lower rate of capital expenditure in the current year.

TANKS' NEW SOURCE OF INCOME

One sentence in the advance statement by Capt. Charles Waterhouse, chairman of Tanganyika Concessions, indicates a development in the affairs of Benguela Railway that could be of extreme importance to the company.

Until this year, traffic on the Benguela Railway, which is a subsidiary of Tanks, had consisted largely of metal from the Copperbelt to Lobito Bay, and, on occasion, coal in the reverse direction. In 1957, however, the railway carried for the first time a quantity of iron ore, originating in Angola, for export from Lobito.

The significance of this lies in its relation to a statement made a fortnight ago when the Governor-General of Angola signed a contract with Companhia Mineira de Lobito and the Sociedade Mineral de Lombije regarding the transport of the ore. The managing director of these two companies revealed that plans for the development of the iron deposits foresaw a first stage when, of a total of 2,000,000 tons, 500,000 tons would be sent via the Benguela line, and a second stage, beginning in 1965, when exports would reach 10,000,000 tons annually. If it be assumed that Benguela would carry a similar proportion of this ore, it is apparent that the new source of traffic could be of transcendent importance.

MORE KAFFIR DIVIDENDS

Further half-yearly dividends from the gold mines of the Rand and its Western extensions are summarized below.

In the Central Mining group's announcements, the older mines steal the limelight. Crown has continued its steady dividend improvement, and is now joined by City Deep and Consolidated Main Reef, whose payments show useful increases over recent levels. The two dividend-paying mines of the J.C.I. group have declared payments much in line with expectations, but among the mines under the aegis of Anglo-Transvaal, Hartebeest will have disappointed some investors by not raising its distribution above last June's 3s. 6d.

The Union Corporation announcements were largely as expected, with the exception of Marievale, which is to pay 1s. 5d., a good improvement over previous distributions.

(*Continued on page* 730)

LAKE VIEW AND STAR

The Forty-eighth Annual General Meeting of Lake View and Star Limited was held on December 18, 1958, in London.

Sir Joseph Ball, K.B.E. (the Chairman), in the course of his speech, said:

The amount of £3,347 which appears in the Profit and Loss Account under the heading of "Special Technical Expenditure" represents the cost incurred in connection with a special geological examination of the mine, which confirmed that in view of its future prospects the completion of the proposed capital expenditure programme would be thoroughly justified.

An interim dividend of 1s. per share was paid during the year, absorbing a net amount of £80,500; and the final dividend of 1s. 6d. per share will absorb a net sum of £120,750.

Despite the increase in working costs of 10d. per ton milled, the total dividend for the year has been maintained at the figure of 2s. 6d. per share.

The total development footage for the year ended June 30, 1958, amounted to 25,445 feet, some 248 feet less than for the previous year.

Ore reserves on July 1, 1958, amounted to 3,530,400 tons at an average grade of 4.84 dwt. per ton. This represented a decrease in ore reserves of 46,600 tons, but an increased grade of 0.06 dwt. per ton. Steps have been taken to develop extra footage during the current year with a view to maintaining the ore reserve position.

The tonnage milled, viz. 743,449 tons, was 1,066 tons below the record figure for the previous year; but gold recovered increased by 898 ounces to 160,523 ounces.

For some years past, I have laid considerable emphasis on the constant battle against rising costs; and I feel that shareholders should be fully acquainted with the reasons for the substantial capital expenditure which has been incurred during recent years.

The average number of men employed on the mine is approximately 1,000, and the basic wages of these men are fixed by the West Australian State Arbitration Court. In 1948, the basic wage was £A6 9s. 6d. per week, whilst today the figure is £A13 11s. 6d.

On top of this, the industry allowance has risen from 22s. (Aust.) to 35s. (Aust.) per week per man; and in 1955 there was an increase in marginal rates for skilled employees of a further 30s. (Aust.) per week. Furthermore, since December, 1956, it has been necessary to add to working costs £9,100 per annum to cope with the recent grant by law of long-service leave.

In addition, we have had to cope with the substitution of steam winding equipment by electric equipment for hoisting purposes.

Some years ago it was recognized that the cost of steam raising for winding had become considerably dearer than the cost of doing the same work with electric power; the programme of conversion to electric power was initiated. During the years 1954 to 1957, £240,000 was spent in converting to electric power the winding equipment at the Associated Lake View and Ivanhoe shafts, which is expected to result in an annual saving of approximately 1s. 6d. per ton of ore milled. Although the bulk of this saving has already been achieved, the full benefit of the electrification of the Ivanhoe Shaft has yet to be felt.

Today, all the shafts on the Lake View and Star mine are equipped with electric winders except the Chaffers Shaft. The Board have now authorized additional capital expenditure amounting approximately to £234,000, mainly for the conversion of the winding installation at Chaffers Shaft and the provision of additional power plant which will be necessary; and it is estimated that this conversion will result in a further saving of 9d. per ton.

When this programme of capital expenditure, which was started in 1954, has been completed, it will have cost some £475,000 and have resulted in an estimated total annual saving of no less than 2s. 3d. per ton of ore milled. At first sight, it might be thought that this saving is of comparatively small importance, but, in fact, the very reverse is the case.

Very substantial savings have been made since 1954 as a result of the progressive conversion to electric power, and today the resulting annual saving is in the region of £50,000. It is anticipated that the electrification of the Chaffers hoist will be completed by December, 1959, and that from that date onwards the total annual saving will amount approximately to £84,000.

If costs are not kept under strict control, large blocks of the lower-grade ore may be rendered unpayable.

As things stand today, your Directors feel reasonably sanguine of being able to maintain the present dividend of 2s. 6d. per annum, and complete the programme of capital expenditure already planned.

The report and accounts were adopted.

MINING FINANCE—*Continued*

Mine	*June* 1957	*Dec.* 1957	*June* 1958	*Dec.* 1958
	s. d.	*s. d.*	*s. d.*	*s. d.*
Central Mining:				
Blyvoor	1 0	1 0	1 0	1 0
City Deep	6	6	6	7½
Cons. M.R.	1 3	1 3	1 3	1 6
Crown	1 0	1 3	1 6	1 9
Durban D.	1 6	1 6	1 6	1 6
E.R.P.M.	2 3	2 3	2 0	2 0
Modder E.	1 0	9	9	6
J.C.I.:				
E. Ch. d'Or	3	4	3	3
Randf'n	2 3	2 3	2 0	2 3
Anglovaal:				
Harties	2 6	3 0	3 6	3 6
Village M.	1	1	¼	—
Union Corporation:				
E. Geduld	2 0	2 0	1 9	1 11
Geduld P.	6 3	6 6	5 0	6 3
Grootvlei	1 1	1 3	1 1	1 3
Marievale	1 0	1 3	1 1	1 5

Other dividends announced by these groups include a startling increase by Consolidated Murchison, the gold-antimony producer, from 2s. 9d. to 5s. 3d., making 8s. for the year against 5s. 6d. in 1957. Middle Wits is paying an unchanged 6d., while Rand Mines is distributing 3s., the same as last December.

New Concession for R.S.T.?—The Chief of the Bamangwatos, Tshekedi Khama, and other Bechuanaland officials, have been meeting Colonial Office representatives in Pretoria to discuss the question of granting a prospecting concession to Rhodesian Selection Trust Exploration. The Bechuanaland delegation has already had talks with R.S.T. representatives in Salisbury.

Better Results from Heidelberg Estates.—As a result of higher income from investments, Heidelberg Estates was able to report a profit on group account of £1,250 for the year to June 30 last, against a loss of £4,431 in the preceding period. Meeting, December 31.

Barclays D.C.O. Raise Final.—Barclays D.C.O. is recommending a final payment of 5 per cent, to make 9 per cent for the year to September 30 last, against 8 per cent last year. Net profit after taxation and transfers to inner reserves was £1,267,355, compared with £1,161,473. Meeting, January 2, 1959.

De Beers Industrial Pays Same.—Estimated net profit for the current year to December 31 of De Beers Industrial Corporation is £1,131,000 after tax. Last year's figure—£3,559,787—is not comparable because of a bonus issue received from African Explosives and Chemical Industries. The dividend of 1s. makes an unchanged total of 2s. per share.

M.T.D.'s First Year.—In its first full year of working, M.T.D. (Mangula) earned a profit after all charges of £3,740, from a production of 10,700 s.tons of concentrate averaging 51.96 per cent Cu. It is pointed out that the result was achieved in spite of the low price prevailing for the metal during much of the year, and the fact that their production rate in the early part of the year was low because of initial tests. The second Aerofall mill should be commissioned during the first quarter of 1959.

Scrip Issue From Jos Tin.—At the annual meeting to be held on January 14, the board of Jos Tin Areas will recommend a one-for-one scrip issue. It is also recommended that the name of the company be changed to Jos Holdings. Profit for the year ended July 31, 1958, was £47,417, compared with £47,860 in the preceding twelve months. The proposed dividend for the year is of 20 per cent, against 22 per cent (including a bonus of 2 per cent) last year.

Tweefontein United Collieries.—Net profit of Tweefontein United Collieries in the year ending December 31 is estimated at £148,000 (last year £140,690). The final dividend for 1958 is 2s. 8d. per share, making a total of 4s. for the year against 3s. 4d. A London quotation was granted to Tweefontein United Collieries in May of this year.

Maiden From Rix-Athabaska.—Rix-Athabaska Uranium Mines have declared a maiden dividend of 5 c. per share. It thus becomes the second of the Canadian uranium producers under the aegis of Rio Tinto to reach the dividend-paying stage.

Cementation Offer For Demolition and Construction.—The Cementation Co. has made an offer of five Cementation shares for every two Demolition and Construction Co. ordinary shares. The Demolition and Construction Co. board is recommending the offer. C.I.C. consent to the issue of Cementation shares has been obtained.

MOUNT ISA MINES

The annual general meeting of Mount Isa Mines Limited was held on December 9, at Brisbane.

Mr. G. R. Fisher, Chairman of the Company, presided, and in the course of his speech said:

The net income for the year ended June 30, 1958, was £1,424,129 compared with £3,140,823 for the financial year ended June 30, 1957.

An interim dividend of 4½d. per stock unit, absorbing £474,978, was paid on June 27, 1958. From profits for the year your Directors have recommended payment of a final cash dividend of 3d. per stock unit, absorbing £316,652.

Your Directors also recommend the distribution of 7½d. per stock unit to be declared wholly and exclusively out of income derived by the Company, which is exempt from income tax by reason of Section 23A of the Income Tax Assessment Act. The 7½d. per stock unit Dividend will come from the Income Tax free Reserve Account.

It is further recommended that the latter dividend be satisfied by an issue of fully paid shares of 5s. each at par, being one fully paid share for every eight stock units held in the Company.

Production and Ore Reserves

Production of silver-lead-zinc and copper ores reached record figures. Ore treated for the year, including both copper and silver-lead-zinc ores, reached a total of 1,655,070 compared with last year's total of 1,404,813 tons.

Blister copper production at 31,165 tons exceeded last year's production by 2,290 tons, and silver-lead-bullion production at 50,960 tons exceeded last year's production by 5,770 tons. Silver in lead-bullion at 4,256,262 oz. exceeded the previous year's production by 368,411 oz.

Zinc concentrate production of 36,128 tons was 724 tons more than the previous year. Zinc in zinc concentrates amounted to 18,984 tons compared with last year's production of 18,386 tons.

The silver-lead-zinc ore reserves were increased by 3,500,000 tons above last year's reserve to a total of 24,200,000 tons, containing 5.6 oz. silver, 7.8 per cent lead, and 5.8 per cent zinc. Copper ore reserves at June 30, 1958, were 3,850,000 tons more than the previous year's figure, with a total of 16,650,000 tons containing 3.75 per cent copper.

Stockholders were informed last year that considerable tonnages of silver-lead-zinc and copper ores have been indicated, particularly by diamond drilling, and will be included in ore reserves as underground development work proceeds.

Expansion Plans

The intermediate expansion programme has been revised, and it is expected that a total of 8,100 tons per day of combined silver-lead-zinc and copper ores will be treated by April, 1959.

Until the new Power House is completed at the end of 1959, some loss of production can occur because of interruptions in power supply from the present plant, which must operate at full capacity to give sufficient power for the treatment of 8,100 tons of ore per day.

The indication at present is that the tonnage rate of 8,100 tons per day will be achieved by April, 1959, but any increase in production beyond that rate is dependent on the rehabilitation of the Townsville-Mount Isa railway, which could not, in its present condition, handle the increased output.

The increase in production has reduced costs considerably, and even lower costs can be expected when production rate is further improved.

The construction of the electrolytic copper refinery by Copper Refineries Pty. Ltd. at Townsville continued satisfactorily throughout the year, and production is scheduled to commence in June, 1959.

Mount Isa Mines Limited has provided £2,000,000 toward the financing of the Electrolytic Copper Refinery, and arrangements have been made for the provision of £1,500,000 by debentures issued privately by Copper Refineries Pty. Ltd. This arrangement will provide sufficient finance to complete the refinery.

Mount Isa-Townsville Railway

Almost three years ago, this Company advised the Queensland Railway Commissioner of the transport requirements to meet a production rate of 13,000 tons of ore per day. Overseas consultants were engaged by the Queensland Government to make a complete study of all aspects of the feasibility of the scheme. The report of the consultants was favourable. Subsequent negotiations with the Commonwealth and Queensland Governments have taken place in connection with the financial arrangements to cover the cost of the project.

Your Directors have not been successful in making final arrangements on a basis acceptable to the Company, but negotiations are still proceeding, and it is hoped that a final decision will be made in the near future.

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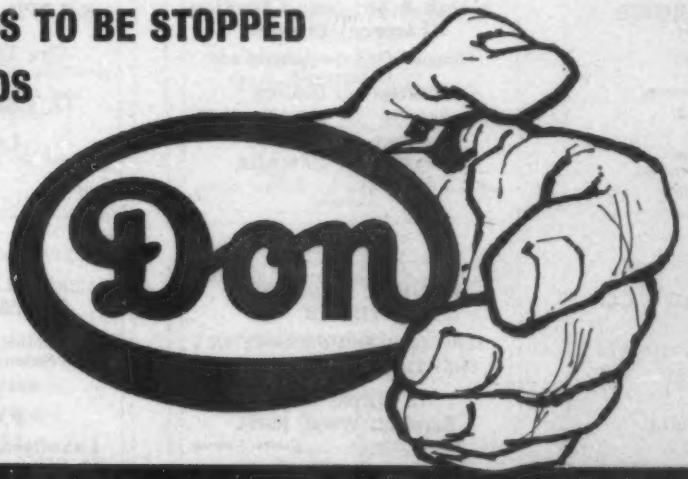

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A geophysical survey of the Renison Bell Tin Field was started in 1950 and continued during 1951 and 1952. The field, located in the west coast region of Tasmania, had up to 1955 yielded about 3,000 tons of metallic tin. *Bulletin No. 43, Geophysical Survey of the Renison Bell Tin Field, Tasmania*, is published by the Commonwealth of Australia, Department of National Development, Bureau of Mineral Resources, Geology and Geophysics. The authors are R. J. Davidson, L. W. Williams, R. P. Loh, J. Horvath, and O. Keunecke.

*

Canada, 1958, a handbook produced by the Information Services Division, Dominion Bureau of Statistics, presents a factual and up-to-date survey of the Canadian economy, and is illustrated with numerous photographs depicting the economic, social and cultural development of the nation. Its contents include a concise review of the minerals industry in 1957. Price $1.

*

Not until geological surveys were made by officers of the Commonwealth Bureau of Mineral Resources and the New South Wales Department of Mines was it established that scheelite in important quantity was to be found about 26 miles north of Yaas, New South Wales, Australia. With the object of delineating the main mineralized areas, the geological surveys were followed by *Report No. 30, Geophysical Survey of the Rye Park Scheelite Deposit, New South Wales*, by J. Horvath and R. J. Davidson. The geophysical survey was commenced on December 8, 1951, and the main part of the survey was concluded on December 22. As a result of the survey, the report of which is published by the Commonwealth of Australia, Department of National Development, Bureau of Mineral Resources, Geology and Geophysics, five well-defined anomalies were revealed.

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